Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1-20 (Canceled).

21. (New) A method of determining at least one characteristic of an earth formation surrounding a borehole comprising:

detecting energy from the formation with a detector during a plurality of sample periods to produce a plurality of samples corresponding to the sample periods;

measuring the standoff of the detector from the wall of the borehole in at least one sample period;

sorting a plurality of the samples into groups, each group covering an azimuthal sector of the borehole;

within a group, mathematically weighting at least one of the samples according to standoff;

within a group, mathematically summing a plurality of the samples to achieve a sample total for an azimuthal sector;

within a group, dividing the sample total by the total duration of sample periods in the group that have been mathematically summed to determine a detection rate for the sector; and

transforming the detection rate for at least one group into a representation of at least one formation characteristic.

22. (New) The method of claim 21 further comprising transforming the detection rate for at least two of the groups into the same formation characteristic to produce an image of the borehole with respect to the particular formation characteristic.

23. (New) The method of claim 21 wherein transforming the detection rate for at least one group comprises transforming the detection rate for at least one group into a representation of a representative formation characteristic of the borehole.

24. (New) The method of claim 21 further comprising emitting energy into the formation.

25. (New) The method of claim 21 wherein detecting energy is detecting counts of gamma radiation.

26. (New) The method of claim 21 further comprising deriving a representation of a representative characteristic for at least two portions of the circumference of the borehole.

27. (New) The method of claim 21 wherein the detector is rotated about an axis in the borehole and the duration of each sample period is shorter than the time that the detector is in an azimuthal sector in one rotation of the detector.

28. (New) The method of claim 21 wherein the energy is detected in a first energy interval and a second energy interval during the sample periods;

wherein the steps of mathematically weighting at least one of the samples according to standoff, mathematically summing the samples, and dividing the sample total by the total duration of the sample periods of the samples are performed with respect to the first energy interval and with respect to the second energy interval; and

wherein transforming the detection rate for at least one group comprises transforming the detection rate for at least one energy interval for at least one group into a representation of at least one formation characteristic.

29. (New) A method of determining at least one characteristic of an earth formation surrounding a borehole comprising:

detecting energy from the formation with a detector during a plurality of sample periods with the detector to produce a plurality of samples corresponding with the sample periods;

sorting a plurality of the samples into a plurality of groups, each group covering an azimuthal sector of the borehole;

within a group, calculating the mean of at least a portion of the samples;

within a group, mathematically weighting at least one of the samples according to the deviation of the at least one sample from the mean and mathematically summing a plurality of the samples to produce a sample total for a sector;

within a group, dividing the sample total by the total duration of sample periods of mathematically summed samples in the group to determine a detection rate for the group; and

transforming the detection rate for at least one group into a representation of at least one formation characteristic.

30. (New) The method of claim 29 further comprising transforming the detection rate for at least two of the groups into the same formation characteristic to produce an image of the borehole with respect to the formation characteristic.

31. (New) The method of claim 29 wherein transforming the detection rate for at least one group comprises transforming the detection rate for at least one group into a representation of a representative formation characteristic of the borehole.

32. (New) The method of claim 29 wherein detecting energy is detecting counts of gamma radiation.

33. (New) The method of claim 29 wherein the detector is rotated about an axis in the borehole and the duration of each sample period is shorter than the time that the detector is in an azimuthal sector in one rotation of the detector.

34. (New) The method of claim 29 wherein the energy is detected in a first energy interval and a second energy interval during the sample periods;

wherein the steps of mathematically weighting at least one of the samples, mathematically summing the samples, and dividing the sample total by the total duration of the sample periods are performed with respect to the first energy interval and with respect to the second energy interval; and

wherein transforming the detection rate for at least one group comprises transforming the detection rate for at least one energy interval for at least one group into a representation of at least one formation characteristic.

35. (New) A method of accounting for error in formation data from a borehole, comprising:

detecting energy from the formation with a detector during a plurality of sample periods to produce a plurality of samples corresponding to the sample periods;

sorting a plurality of the samples into groups, each group covering an azimuthal sector of the borehole from which samples were detected; and

within a group, mathematically weighting at least one of the samples according to a standoff of the detector when the sample was detected.

36. (New) The method of claim 35 further comprising transforming the detection rate for at least one group into a representation of a formation characteristic.

37. (New) The method of claim 35 wherein detecting energy is detecting counts of gamma radiation.

38. (New) The method of claim 35 wherein the duration of each sample period is shorter than the time that the detector is in the azimuthal sector in one rotation of the tool.

39. (New) The method of claim 35 further comprising comparing the groups to determine whether one or more groups covering azimuthally adjacent sectors have a substantially different formation characteristic than another of the groups.

40. (New) The method of claim 39 further comprising comparing less than all of the groups.

41. (New) A logging system for use in determining a characteristic of an earth formation surrounding a borehole, comprising:

a housing;

a detector coupled to the housing and adapted to detect energy from the formation;

a standoff measurement device coupled to the housing and adapted for use in determining the standoff of the detector from the borehole;

a position sensing device coupled to the housing and adapted for use in determining the position of the logging tool relative to the borehole; and

a processor in communication with the detector, the standoff measurement device, and the position sensing device and operable to perform the following:

communicate with the detector to detect energy from the formation during a plurality of sample periods and produce a plurality of samples corresponding to the sample periods;

communicate with the standoff measurement device to determine the standoff of the detector from the borehole in at least one sample period;

sort a plurality of the samples into groups covering an azimuthal sector of the borehole;

within a group, mathematically weight at least one of the samples according to standoff of the detector when the sample was recorded.

42. (New) The logging system of claim 41 wherein the processor is further operable to perform the following:

within a group, determine a detection rate of weighted samples for the group; and

transform the detection rate for at least one group into a representation of at least one formation characteristic.

43. (New) The logging system of claim 41 further comprising an emitter coupled to the housing and operable to emit energy into the formation.

44. (New) The logging system of claim 41 wherein the detector is operable to detect counts of gamma radiation.

45. (New) The logging system of claim 41 wherein the detector is rotating about an axis in the borehole and the duration of each sample period is shorter than the time that the detector is in an azimuthal sector in one rotation of the detector.

46. (New) The logging system of claim 41 where the detector comprises a first detector operable as short space detector and a second detector operable as a long space detector.

47. (New) The logging system of claim 41 wherein the standoff measurement device is an acoustic caliper.

48. (New) The logging system of claim 41 further comprising at least one of a magnetometer and accelerometer coupled to the housing and in communication with the processor.

49. (New) The logging system of claim 41 wherein the processor is further operable to perform the following:

determine if at least one group needs to be compensated for variations in standoff; and

mathematically sum samples that have not been weighed in any group that does not need to be compensated for variations in standoff.

50. (New) A method of evaluating a formation characteristic surrounding a borehole using a rotating logging tool, comprising:

emitting energy into the formation;

detecting energy from the formation as a plurality of samples of energy;

sorting a plurality of the samples into groups, each group covering an azimuthal sector of the borehole from which samples were detected; and

comparing a plurality of the groups to determine whether one or more groups covering azimuthally adjacent sectors have a substantially different formation characteristic than another of the groups.

51. (New) The method of claim 50 further comprising:

transforming the samples of at least two groups determined not to have a substantially different formation characteristic into a representation of the formation characteristic.

52. (New) The method of claim 50 further comprising

calculating a representation of the same formation characteristic for at least two groups; and

wherein comparing the groups to determine whether one or more groups covering azimuthally adjacent sectors have a substantially different formation characteristic than another of the groups comprises comparing the representation of the formation characteristic between the groups.

53. (New) The method of claim 50 wherein comparing a plurality of the groups to determine whether one or more groups covering azimuthally adjacent sectors have a substantially different formation characteristic than another of the groups comprises comparing less than all of the groups.

54. (New) The method of claim 50 wherein the samples comprise counts of gamma radiation.